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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/914,005	01/11/2002	Bernd Krause	WEB 0044 PA	7204
23368	7590	10/23/2003	EXAMINER	
DINSMORE & SHOHL LLP ONE DAYTON CENTRE, SUITE 500 ONE SOUTH MAIN STREET DAYTON, OH 45402-2023			MENON, KRISHNAN S	
			ART UNIT	PAPER NUMBER
			1723	

DATE MAILED: 10/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/914,005

Applicant(s)

KRAUSE ET AL.

Examiner

Krishnan S Menon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

Claims 16-34 are pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
1. Claims 16-27 and 29-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Siggel et al (US 4,380,594) in view of Klotzer et al (5,980,795).

Siggel teaches a method of making a polymeric membrane comprising providing a mix of polymers (abstract, figures), a fluid that dissolves or gels in the polymer from 0.05 to 4.5% (col 2 lines 54-59), charging the polymer mix with a gas (abstract), and foaming the polymer mix at temperature above glass transition (abstract), as in claim 16.

Siggel is silent on cooling the polymer membrane after foaming. Klotzer teaches cooling the membrane for stabilization (col 3 lines 45-50). It would be obvious to one of ordinary skill in the art

at the time of invention to use the teaching of Klotzer in the teaching of Siggel to make hollow fiber membranes to obtain the desired properties of the membrane (Klotzer col 32-35)

Claims 17-20, 23-25 and 31 add further limitations which Siggel teaches as follows: The fluid is infiltrated in the polymer as in claim 17, and is added to the polymer during manufacture as in claim 18, fluid is a gas or a liquid as in claim 19 (abstract), organic liquid as in claim 20 (abstract). The gas is charged after heating above the glass transition temperature and then extruded to foam the polymer as in claim 23 (abstract). The gas is nitrogen or argon as in claim 24 (col 3 lines 51-53), and carbon dioxide as in claim 25 (col 3 lines 51-53). Hollow fiber membrane as in claim 31 (col 1 lines 54-59).

Claims 21, 22, 26, 27, 29, 30, 32, 33 and 34 add further limitations as follows: the polymer being charged with gas below the glass transition temperature and foamed above the glass transition temperature in claim 21, polymer charged after shaping gas at below the glass transition temperature in claim 22, and the polymer is saturated with gas in claim 26, claim 29 adds polymer material like polysulfone, cellulose etc, hollow surface fiber membrane in claim 30, which is asymmetric in claim 32 and 33, use of membranes in claim 34 - all of which Siggel does not teach. Klotzer teaches charging the gas below the glass transition temperature and then foaming at above the glass transition temperature (col 4 lines 19-40), charging gas after shaping and below the glass transition temperature (col 3 lines 51-57), gas is saturated (col 4 lines 29-31), thermoplastic polymer (like polysulfone, etc) (col 3 lines 64-67) and cellulose acetate (col 1 lines 39-41), asymmetric hollow surface and hollow fiber membrane (col 3 lines 50-63), and use as a filtration membrane as in claim 34 (col 4 lines 4-12). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Klotzer in the teaching of Siggel to make hollow fiber membranes to obtain the desired properties of the membrane (Klotzer col 32-35). Regarding claim 27, Siggel in view of

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Klotzer does not specifically state temperature between 100 and 200 C. However, Klotzer teaches temperature above glass transition temperature. It would be obvious to one of ordinary skill in the art at the time of invention that the glass transition temperature would depend on the polymer or the polymer mix selected and could be between 100 and 200C depending on the polymer or polymer mix. [glass transition temperature of polysulfone at 190C: ref: www.boedeker.com/udel_p.htm].

2. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Siggel (594) in view of Klotzer (795) as applied to claim 16 above, and further in view of Malon et al (US 5,013,767).

Siggel in view of Klotzer does not teach the solvents of the instant claim. Malon teaches 1-methyl 2-pyrrolidone, dichloroethane and other solvents for melt-extruded hollow fibers (col 14 lines 35-40, col 12 lines 34-36). It would be obvious to one of ordinary skill in the art at the time of invention to use the solvent for polysulfone as taught by Malon in the teaching of Siggel for making asymmetric gas separation membranes.

Response to Arguments

Applicant's arguments filed 9/11/03 have been fully considered but they are not persuasive.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). Applicant's argument is that Siggel does not teach a porous membrane. However, applicant does not claim a 'porous' membrane in all the claims, except in claims 32-34, wherein, an indication of a porous membrane is given by

claiming 'asymmetric membrane' or by the use. The examiner has shown how the Siggel process could be modified by using the Klotzer ref to make asymmetric the membranes, and has provided the motivation that can be found in the references themselves. In addition, since Siggel teaches a method in which the polymer is charged with a gas and then foamed as in the claimed invention, Siggel method would inherently create the surface pores as in the claimed invention if the claimed invention creates such pores. Re the "substantially whole outer covering" and "practically no burst cavities" in col 8 lines 56-60 of Siggel only mean that longitudinal pores through the fibers do not burst out the side walls or surface. The very next line of Siggel says that cavities of less than 1 micron have not been included in the count, which would be true for both the cross-section and the surface pores. In col 1 lines 18-21 of Siggel, it says, "For example, they may be very small and impart a microporous structure to the fiber. Alternately, the cavities may be of large dimensions and form a microporous structure."

Now, if the applicant's intent was to argue that the references were from non-analogous arts, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, both references are from analogous fields, they both teach the method of spinning hollow fibers, and the deficiencies in one reference are overcome by the second reference as pointed out in the rejection.

Re the argument that the prior art fails to show every aspect of the invention: The argument is that the Siggel ref does not contain "... about 0.05 to 4.5% ... fluid that dissolves or swells the polymer ...". Applicant agrees that up to 1% silicone oil is added in the Siggel process, but Siggel's reason for adding is to 'improve the gliding properties of the polypropylene also to function to a

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certain extent as plasticizer". The express, implicit, and inherent disclosures of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. 102 or 103. "The inherent teaching of a prior art reference, a question of fact, arises both in the context of anticipation and obviousness." In re Napier, 55 F.3d 610, 613, 34 USPQ2d 1782, 1784 (Fed. Cir. 1995) (affirmed a 35 U.S.C. 103 rejection based in part on inherent disclosure in one of the references). See also In re Grasselli, 713 F.2d 731, 739, 218 USPQ 769, 775 (Fed. Cir. 1983). In this case, the reference adds silicone oil, and if silicone oil functions as a solvent in the instant application, it would function as a solvent in the reference as well. Also, plasticizers are also known to solubilize the polymer. The word 'gliding' means 'moving smoothly' '... water flowing smoothly' [Webster's Collegiate Dictionary, 10th edition]; so, obviously, Siggel intended to solubilize (or plasticize) the polymer by adding silicone oil to "glide" through the nozzle.

Re the argument about the Malon ref: Malon ref is used to show the specific solvents used, not for gas charging or foaming like the applicant argues. Arguments re the concentration of solvent used in Malon is also not relevant, because Malon is used to show only the types of solvents. Like NMP or dichloroethane.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on

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the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 703-305-5999. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 703-308-0457. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Krishnan Menon
Patent Examiner


JOSEPH DRODGE
PRIMARY EXAMINER